8

CLAIMS

1   1. A method for encoding a video signal with reduced noise, comprising the steps of:

2   estimating motion for each macroblock in an input video signal N times (where N is an

3   integer) to yield N sets of motion estimation decision sets, each set including a reference

4   picture index and motion vector;

5   creating, for each macroblock, a noise reduced macroblock using the N sets of motion

6   estimation data; and

7   encoding each noise reduced macroblock using a best one of the motion estimation

8   data sets.

1   2.   The method according to claim 1 wherein the step of estimating motion further

2   includes the step estimating the motion N times using each of N different reference pictures.

1   3.   The method according to claim 1 wherein the step of creating the noise reduced

2   macroblock further comprises the steps of:

3   selecting at least a plurality of the N sets of motion estimation decision sets; and

4   temporally filtering each pixel in the macroblock to using the selected motion

5   estimation decision sets.

1   4.   The method according to claim 3 wherein the selecting step further comprises

2   the steps of:

3   generating a predictor for each motion estimation decision set;

4   calculating a difference between the predictor and the current pixel;

5   determining whether the difference is less than a threshold; and if so

6   selecting the motion estimation decision set whose difference is less than the

7   threshold.

1   5.   The method according to claim 1 further comprising the step of spatially

2   filtering the input video prior to estimating motion.

1   6   A method for encoding a video signal with reduced noise, comprising the steps

2   of:

3   estimating motion for each macroblock in an input video signal N times (where N is an

4   integer) using each of N separate reference pictures to yield N sets of motion estimation

5   decision sets, each set including a reference picture index and motion vector;

6   creating, for each macroblock, a noise reduced macroblock using the N sets of motion

7   estimation data; and

8   encoding each noise reduced macroblock using the best one of the motion estimation

9   data

1   7.   A video encoder, comprising:

2   a motion estimation stage for estimating the motion in each macroblock of an input

3   video signal N times (where N is an integer) to yield N sets of motion estimation decision sets,

4   each set including a reference picture index and motion vector,

5   a noise reducer for creating a noise reduced macroblock using the N sets of motion

6   estimation data;

7   encoding means for encoding the noise reduced macroblock.

1   8.   The encoder according to claim 7 further including a reference picture store for

2   storing coded pictures and where the motion estimation stage estimates the motion N times

3   using each of N different stored reference pictures.

1   9.   The encoder according to claim 7 further comprising:

2   a reference picture store for storing the coded pictures;

3   means for applying the stored previously coded pictures as input video stream to for

4   estimating the motion for each macroblock to yield the N sets of motion estimation decision

5   sets; while

6   means for applying the motion estimation decision sets to filter pictures for noise

7   reduction.

1   10.   The encoder according to claim 7 further comprising a spatial filter for

2   spatially filtering the input video prior to performing motion estimation.